

## A Hedge with an Edge for Erosion Control

One way farmers can preserve soil and protect water quality is by planting grass hedges to trap sediment that would likely otherwise be washed away in runoff from the field.

Researchers conducted a series of studies over 13 years to assess the effectiveness of grass hedges for erosion control in wide-row or ultra-narrow-row conventional tillage or no-till cotton systems. They established single-row continuous swaths of a noninvasive variety of miscanthus grass across the lower ends of 72-foot-long plots with a 5-percent slope. Then they tracked how much sediment was trapped by the vegetation from both the wide-row and ultra-narrow-row conventional tillage and no-till fields.

When mature, the hedges captured about 90 percent of eroded sediment from ultra-narrow-row conventionally tilled fields and only about 50 percent of sediment from no-till fields. Nevertheless, the actual soil loss from the no-till plots—either with or without grass hedges—was much less than that from conventionally tilled plots with or without grass hedges, because no-till production greatly reduces erosion. *Seth Dabney, USDA-ARS National Sedimentation Laboratory, Oxford, MS; (662) 232-2975, seth.dabney@ars.usda.gov.*

## First Hard Winter Wheat Varieties for Eastern U.S. Production

The first hard winter wheat varieties bred for production in the eastern United States have been developed by the Agricultural Research Service.

Hard wheat, which is used for baking bread, has been a production challenge for farmers in the eastern United States because the area's humidity increases the incidence of disease in the field, which affects yield and grain quality. But NuEast, a new variety of hard red winter wheat, has good grain yield and moderate resistance to powdery mildew and stem rust, including Ug99 races. It also has good resistance to leaf rust.

Another new wheat variety on deck is a hard white winter wheat called "Appalachian White." This variety was tested for 3 years at six locations and consistently produced good yields and better grain quality than other hard white winter wheats tested. Appalachian White also showed a higher level of resistance to powdery mildew, stripe rust, leaf rust, and Hessian fly than other hard white wheats. *David Marshall, USDA-ARS Plant Science Research Unit, Raleigh, NC; (919) 515-6819, david.marshall@ars.usda.gov.*

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**ARS studies show that the antioxidant content of peanuts and their oil is affected by roasting length.**

## Roasting Does More Than Enhance Flavor in Peanuts

Researchers have shown that increasing roast color intensity steadily ramps up the antioxidant capacities of peanuts, peanut flour, and peanut skins.

Peanuts were incrementally roasted at 362°F from zero to 77 minutes and then sampled for water- and oil-soluble antioxidant activity levels. Dark-roasting consistently increased water- and oil-soluble antioxidant capacities for both commercially available peanut flours and blanched peanuts. Peanut skins, currently considered a waste product of industrial peanut processing, had remarkably high antioxidant capacities across all roast conditions. Antioxidant increases upon

roasting in blanched seed peanut were attributed to greater concentrations of phenolic compounds and/or "browning" reaction products.

The researchers also found that vitamin E degradation was most rapid in oil obtained from lightly roasted peanuts and that oil from darker roasted peanuts had better vitamin E retention than oil from lightly roasted or even raw peanuts. These findings could be a result of increased concentrations of oil-soluble Maillard reaction products, which seem to protect vitamin E from oxidation. *Jack Davis, USDA-ARS Market Quality and Handling Research Unit, Raleigh, NC; (919) 515-6312, jack.davis@ars.usda.gov.*

## New Vaccines May Help Thwart *E. coli* O157:H7

Researchers have developed two forms of a vaccine that might help reduce the spread of *Escherichia coli* O157:H7 bacteria in calves.

In preliminary tests, 3-month-old Holstein calves were immunized with either form of the vaccine or a placebo. Six weeks later, the animals were given a dose of *E. coli* O157:H7, and for the next 18 days their manure was tested for evidence of the microbe. Vaccinated calves had reduced or nondetectable levels of *E. coli* in their manure within only a few days after being inoculated.

Preventing *E. coli* O157:H7 from proliferating inside cattle helps limit the transmission of pathogens that cause foodborne illness in humans. It reduces the rate of *E. coli* contamination of meat at packinghouses and reduces shedding of the microbe into the animals' manure. It also lessens the chance that manure-borne *E. coli* will contaminate drinking water or irrigation water, which in turn lowers the risk of contamination of fruits, vegetables, or other crops. *Vijay Sharma and Tom Casey, Food Safety and Enteric Pathogens Research Unit, Ames, IA; (515) 337-7279 [Sharma], (515) 337-7726 [Casey], vijay.sharma@ars.usda.gov, thomas.casey@ars.usda.gov.*